

REMARKS/ARGUMENTS

35 USC 103

The Office rejected **claims 1, 6-10, 12, and 15-16** as being obvious over Miller (U.S. Pat. No. 4,080,424) in view of "environmental expert" and Cabbage (U.S. Pat. No. 3,301,778). The applicant respectfully disagrees, especially in view of the amendments herein.

Amended **claim 1** (and dependent claims 6-10) expressly requires a "... solvent source that is configured to provide a *carbon dioxide-depleted hydrogen sulfide-containing lean physical solvent*..." wherein the *vacuum stripper produces* an "...*ultra-lean physical solvent from the carbon dioxide-depleted hydrogen sulfide-containing lean physical solvent*...". Moreover, the claims also require that the "...*high-pressure* flash vessel [and/or] a *medium pressure* flash vessel...are *configured to provide a substantially hydrogen sulfide-free stripping gas to the vacuum stripper*..." These elements are clearly neither taught nor suggested by the cited references.

Similarly, amended **claim 12** (and dependent claims 15-16) expressly requires a step of "... separating in at least one of a *high-pressure* flash vessel and a *medium pressure* flash vessel a *substantially hydrogen sulfide-free stripping gas* from a physical solvent...", and a step of "...*using the substantially hydrogen sulfide-free stripping gas* to strip hydrogen sulfide from a carbon dioxide-depleted *hydrogen sulfide-containing lean physical solvent* in a vacuum stripper to form the ultra-lean physical solvent..." Again, these elements are clearly neither taught nor suggested by the cited references.

The office seems to assert that Miller's intermediate and medium pressure separators would provide stripping gas to the stripper (page 3, lines 1-9). However, this is clearly not the case for various reasons. First, Miller teaches an intermediate pressure separator and an atmospheric pressure separator. Second, the intermediate pressure separator unambiguously and exclusively provides recycle hydrocarbon vapor to the absorber. Third, the atmospheric pressure separator provides flashed gases comprising nearly all of the CO₂ and most of the H₂S to the first and second absorbers and not the strippers. Consequently, as not all of the elements are present in the cited references, the rejection should be withdrawn.

Moreover, the above differences are not mere design choices but bear significance to the claimed subject matter. Among other things, as Miller flashes the rich solvent to atmospheric pressure, the resulting flashed gas is necessarily rich in CO₂ and H₂S, which is contrary to a flash vessel that provides substantially hydrogen sulfide-free stripping gas to the vacuum stripper. Consequently, a second solvent cycle is required by Miller to remove H₂S. The configurations according to the inventive subject matter overcome such requirement. Still further, Miller's atmospheric separator does not produce a carbon dioxide-depleted hydrogen sulfide-containing lean physical solvent (*e.g.*, column 5, lines 17-47). The office's combination with "environmental expert" and Cabbage does not remedy this defect. Therefore, the rejection is improper and should be withdrawn.

The Office rejected **claims 2-5 and 13-14** as being obvious over Miller in view of "environmental expert" and Mak (U.S. Pat. No. 7,192,468). The applicant respectfully disagrees, especially in view of the amendments herein.

With respect to Miller and environmental expert the same considerations and arguments as provided above apply. Regarding Mak, it is pointed out that Mak uses desulfurized gas (see *e.g.*, Table 1) and even suggests H₂S scavenger beds upstream of the absorber. Clearly, Mak is not concerned with stripping H₂S from a lean solvent to produce an ultra-lean solvent and can not produce a hydrogen sulfide-containing lean physical solvent. Furthermore, Mak flashes the solvent to produce hydrocarbon recycle vapors, above the CO₂ bubble point and to produce CO₂ for sequestration at lower/atmospheric pressure. The vacuum stripper is then used to polish the flashed solvent using a hydrocarbon stream, typically from the treated hydrocarbon gas. Such scheme is entirely inconsistent with the presently claimed configuration.

Claims 1-10 and 12-16 were further rejected as being obvious over Ameen (U.S. Pat. No. 3,594,985) in view of Gravis (U.S. Pat. No. 3,841,382). The applicant again respectfully disagrees, especially in view of the amendments herein.

It is entirely unclear to the applicant how Ameen could be properly applied to the instant claims. Ameen teaches a high-pressure flash vessel from which a hydrocarbon recycle stream is routed back to the absorber and a low pressure flash vessel from which the acid gas is released. The so flashed semi-lean solvent is then fed to an air stripper for further removal of acid gas

(here H₂S). There is clearly no teaching of a solvent source that provides a lean physical solvent, a vacuum stripper that produces an ultra-lean solvent from the lean solvent, let alone a vacuum stripper in which flashed gases from the high-pressure flash vessel and/or medium pressure flash vessel is used for stripping. Thus, hydrogen sulfide-free stripping gas can not be delivered to the vacuum stripper in Ameen's configuration.

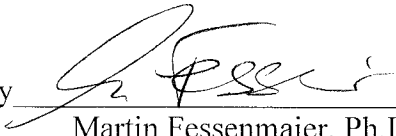
Gravis fails to remedy these defects. Indeed, all Gravis teaches is a glycol reconcentration system in which water is driven from the desiccant using heat, vacuum, and a stripping gas that may be flue gas from the reboiler stack. The office then stated that it would have been obvious to substitute the CO₂ rich gas from the low pressure flash tank of Ameen for the preheated air to so arrive at the claimed subject matter as such replacement would be deemed interchangeable (per teachings of Gravis). This argument is not well taken. Among other reasons, the flash gases from Ameen's separator are at low pressure (12-36 psia) and as such not suitable to produce an ultra-lean solvent from a lean solvent as presently claimed. Furthermore, if one would follow the office's suggestion to use the CO₂ gas from the low-pressure vessel for stripping, one would recombine the otherwise separately isolated H₂S and CO₂. Such recombination is in most instances undesirable as the routes of disposal are significantly different for both contaminants. Therefore, and at least for these reasons, claims 1-10 and 12-16 should not be deemed obvious over the cited art.

Request For Allowance

Claims 1-16 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,
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